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Explosion at Dunbar Furnace.

By E. C. PECHIN.*

AT the suggestion of some members of the Institute, attention is called to the record of the working of Dunbar Furnace during the twelve months ending in January 1874. During this period, with a product of over eleven thousand gross tons, not a single ton of white or mottled iron has been made, and not over 5 per cent. of close mill. About one-third was foundry, and the balance an open, soft grey forge iron.

The furnace is 16 feet bosh and 58 feet high; closed top; fuel, Connellsville coke; ores, native argillaceous carbonates, containing about 35 to 40 per cent. metallic iron when raw, mixed with 1-10 to 1-5 Lake Superior ores and mill cinder. As the native ores are very silicious, the amount of lime used is large, from 1¼ to 1½ ton of iron. The consumption of fuel averages from 1½ to 1¾ of coke, to ton of iron. Such regular working shows a furnace in good condition, and a high degree of attention and ability on the part of the founder. Mr. HEALY, the founder, always carries enough fuel to insure a standard grey iron. The heats, ordinarily 850° to 900°, are most carefully watched and regulated. If the furnace works hot, as is often the case, with a tendency to swing off in silvery iron, it is cooled down by the blast. The ordinary pressure of blast is 4 to 5 lb., but in such case it is increased to 7, 8, or even 9 lb., until the tendency is checked. With a little practice, the keeper and engineer can tell by the cinder what changes to make in heats and blast. It becomes an interesting question, whether the irregular working of many furnaces is not caused by too much dependence upon the hot blast, and not enough upon the engine and fuel.

As far as can be ascertained, the above running is the most regular on record in this country, and the object in introducing the subject is more to call out comparisons than to indulge in boasting. This regularity was rudely interrupted on the evening of Friday, January 16, 1874, by a terrific explosion of gas. By reference to the diagram its nature and effect will be more readily perceived.

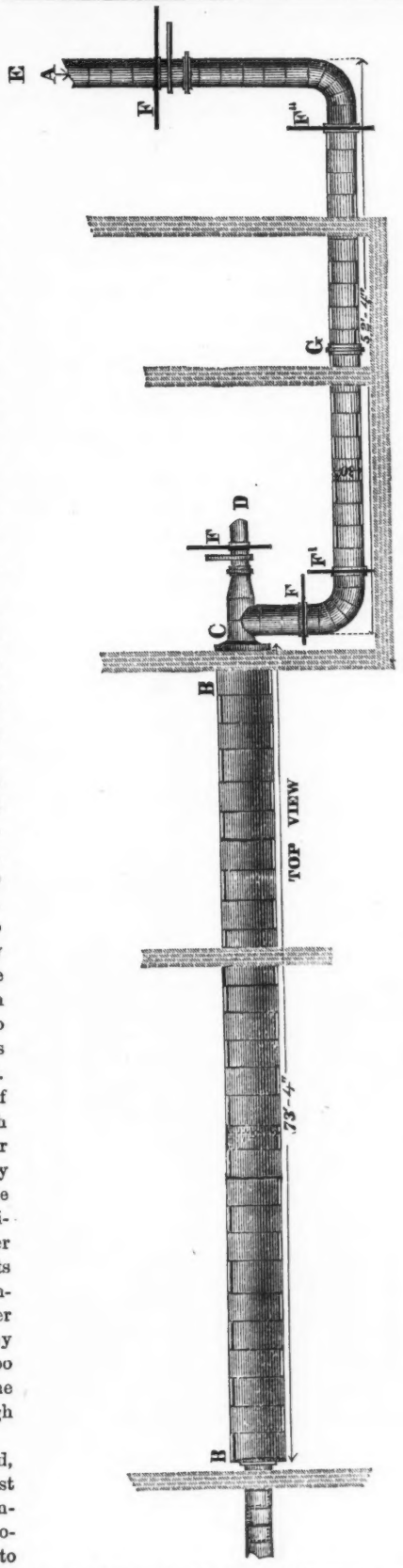

Figure 1.—The Receiver at Dunbar Blast Furnace after the Explosion.

The receiver was 5 feet diameter, 75 feet long, running through the casting house, and made of the best 3-16 iron. It was connected at B with a 30" pipe, leading to hot blast stoves, and at C with same sized pipe, leading to old engine at D. and new large engine at E. It was the intention in the spring to move the old engine, but in the meantime a connection was carried around it, to the new engine, so as to use the old engine in case of necessity; a very wise precaution, as it turned out.

About noon on Friday, a leaking tuyere had been removed from the back arch, but towards night the founder became suspicious of the new tuyere. He cast at 8 instead of 9, the usual hour, the iron running hot and fluidly, and proving a No. 2 foundry. He took the men from the casting-house, and was just drawing the back tuyere, when an explosion of fearful violence took place, shaking the vicinity like an earthquake, and distinctly heard at a distance of from ten to thirteen miles. The receiver was split into fragments, ripped, twisted and torn, vertically, horizontally, and every other way. Pieces were carried over a quarter of a mile. The iron roof of the casting house, 50x80, was rolled up in a shapeless mass, and jammed in the lower corner of the casting house; great holes were torn in the heavy walls of the casting and old engine houses. A temporary frame

Figure 2.—The Blast Cylinder after the Explosion.

building over the new engine supplied the office boy, with the smallest amount of physical exertion, with kindling wood for many days, and the debris generally looked as if it had been in the mill of the gods, although there is abundance of authentic evidence that on this occasion it wasn't ground slow.

The vagaries of the gas were curious, and an interesting question arises—Why should it have thus vagarized? The pipe between the hot blasts and receiver was undisturbed, not a seam or a rivet started, but all that was left of the receiver was the head connected with this pipe, looking like young Norval's father's shield, with the old gentleman in an attitude. Every rivet was cut off as smoothly as with a chisel.

The black lines show the points of fracture. Every flange between C and both engines was broken and torn off, except G, which was left sound and tight. The 30" pipe between C and D, C and F', and F'' and E, were blown off bodily, as between the flanges, the pipes themselves being uninjured; the bolts connecting the flanges and the cast iron flanges themselves were cut off and broken. The long piece of pipe between F' and F'' remained in its place, entirely uninjured.

The force exerted was so tremendous that in driving off the pipe connecting with the new engine, it broke great pieces off of the heavy castings of the upper and lower blast cylinder heads, and cracked one side of the massive standard supporting the blast cylinder, at H. Of course the engine was completely disabled.

One man was instantly killed, being decapitated by a piece of the receiver. His head was found fifteen feet from his body, rolled up in the heavy sheet iron. Two men, standing in the lower end of the casting house, were injured—one seriously and the other slightly. Had the explosion occurred a minute sooner, the founder and all of the men on turn could hardly have escaped death.

Fortunately all the steam and water pipes were left intact, the old engine only slightly injured, and there was on hand a lot of 16" pipe. By working night and day, the repairs were completed, a temporary connection made, and on Monday night, at 8 o'clock, the blast went on again, after a stoppage of only three days.

Our long and handsome record was broken by 9¼ tons of white iron. This was

CONCLUDED ON PAGE 182.

* A paper read at the New York Meeting of the American Institute of Mining Engineers, February 26, 1874.

The Mining and Metallurgical Laboratories

OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

At the Boston meeting of the Institute of Mining Engineers, Prof. RICHARDS described the mining and metallurgical laboratories just completed at Boston, and as the introduction of these practical means of instruction is comparatively new in America, we lay before our readers illustrations showing their arrangement. The mining laboratory shown in Figure 1, contains an upright tubular boiler, a 15 horse power engine, a 5-stamp battery of the Colorado pattern, an amalgamating pan, settler and concentrator, Blake crusher, Whelpley & Story pulverizer, an Edge stone mill, a Rittinger shaking table, Freiberg shaking table, hand jig, Sturtevant fan and a Batchelder's dynamometer. In working with this apparatus each student receives a quantity of ore, and first determines the minerals present in it, assays it, and passes it through the proper machines, assaying the products at every step, and calculating also the expenditure of power, etc. The ores are obtained from various mining localities in this country.

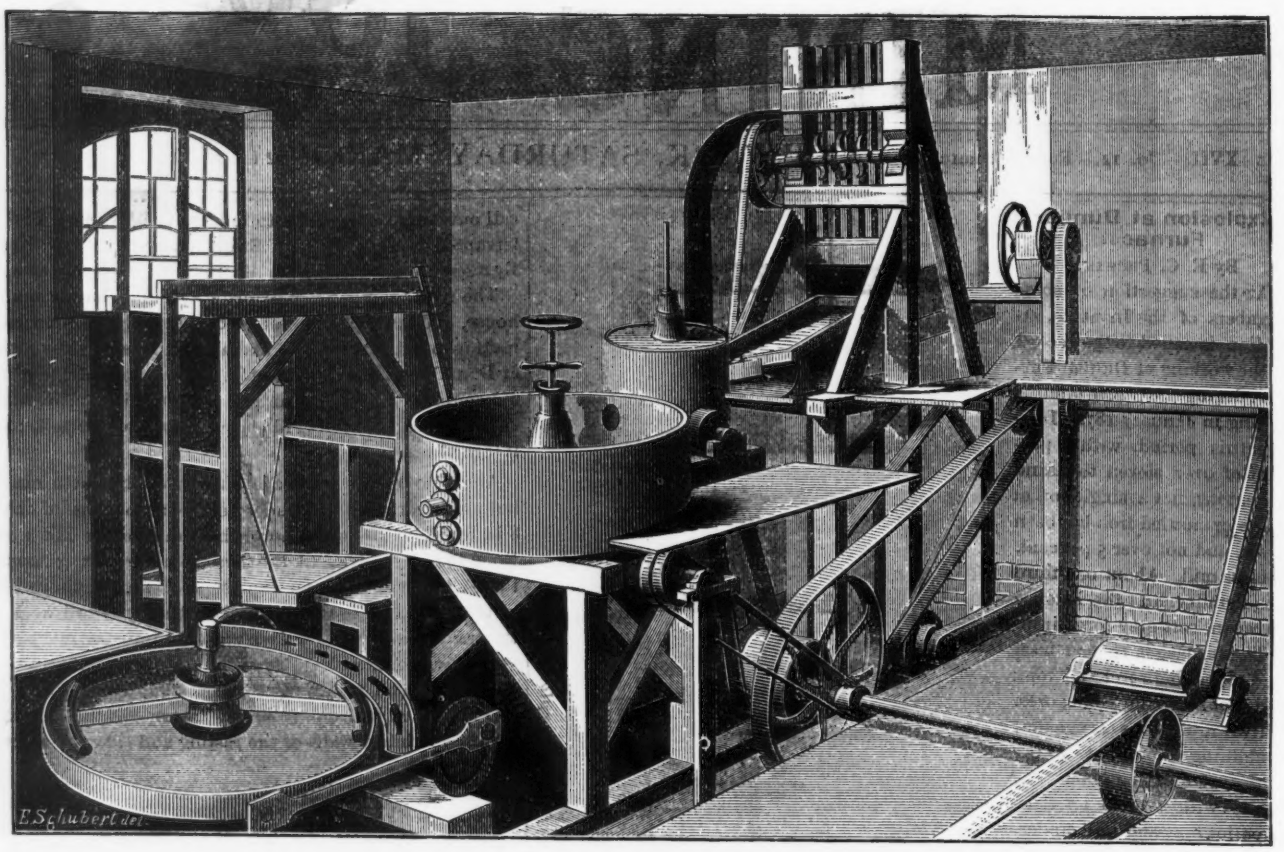

FIG. 1.—MINING LABORATORY.

Figure 2 shows the metallurgical laboratory, which contains a blast furnace, reverberatory for roasting and smelting, cupel, assay furnaces and forge. It will be seen that neither of these is properly a mining workshop, one being fitted up for the mechanical and the other for the chemical treatment of ores already mined. This omission is, however, partially supplied by a set of mining models which show the various modes of working out deposits, pumping, ventilating, etc. No amount of office work, or even workshop practice, will supply the place of actual experience, and the most that a student can accomplish in such laboratories as these is to learn the tools by handling them, to gain by furnace work a realising sense of the processes he hears discussed in lectures and reads about in books, and finally to lose, in part, his diffidence. But these are great advantages, and the establishment of the laboratories described is a decided credit to the Massachusetts Institute.

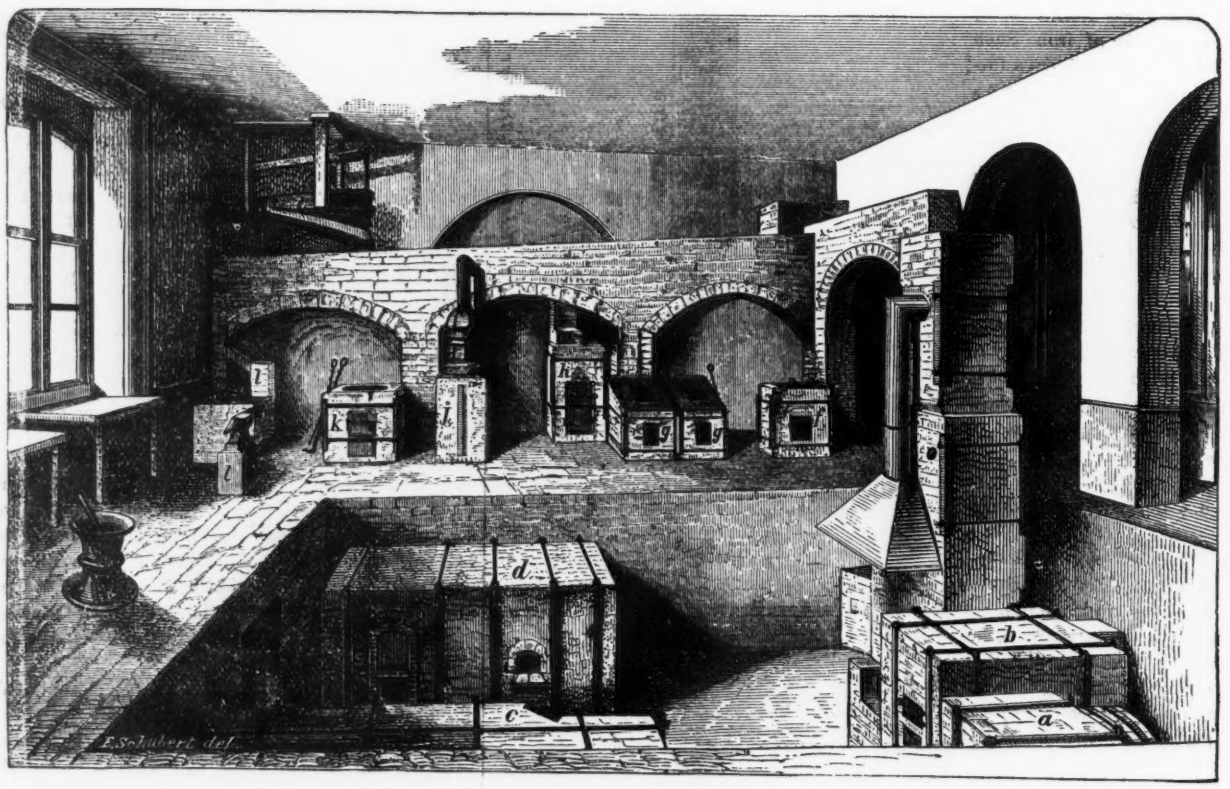

FIG. 2.—METALLURGICAL LABORATORY.

A Mining Society in Colorado.

THE Colorado *Mining Review* for February contained a call for a meeting in Georgetown, on the 11th of March, for the purpose of organizing an Association of Mining and Metallurgical Engineers. At the meeting, papers on Ore concentration, the Present *status* of the milling business, and the Occurrence of native metals in fissure veins, were to be read. We welcome this new society with unfeigned pleasure. For many years Colorado exhibited a woful disregard of criticism and improvement, and looked about despairingly for a "process," as if its only hope lay in some inventor's lucky hit. That was the time of the Territory's

greatest depression and deservedly so. After years of comparative idleness, better ideas crept in one by one, individual successes were made here and there, by employing old and well understood methods instead of new ones, and the Territory has now been for some time prosperous and increasingly so. In 1861, Colorado metallurgy was principally embodied in a number of California mills of about the '59 pattern. Now that Territory is a leader in a new and distinctive treatment of ores. We do not mean new in the sense of a lately discovered process, but new in the mining history of the West. Amalgamation, which was formerly the sole dependence of the miner, has been partially displaced, and what remains is carried on more intelligently. Smelting has come in and is well established. We look upon the formation of a Territorial Society of Engineers—*working* engineers—as one of the best signs in the new order of things. That it will be a help to the miners, we have not the least doubt. The *Mining Review* is itself one of the most creditable professional enterprises, not only west of the Missouri, but anywhere in this country; and its devotion to the interests of those for whom it is published, and its intelligent handling of mining problems would make it a credit to any country.

Blanchet's Pneumatic Hoisting from Deep Mines.

Transactions, North of England Institute of Mining Engineers.

(CONTINUED FROM PAGE 162.)

Results of the Experiments at Epinac.

THE experimental tube submitted to the Universal Exhibition at Lyons, was 6¼ inches diameter, made of sheet iron barely one-tenth of an inch, and bolted together in lengths of 39 inches, by means of flanges and India rubber washers. It was fixed upon a wooden scaffold about 95 feet high; at the bottom were two exhausting cylinders, 12 inches diameter and 15 inches stroke, worked by a steam engine indicating 12 horse power. Under these conditions the experiments proved that a weight of 264 lb. could be raised at the rate of 20 feet a second, which gives a useful effect of $\frac{264 \times 20 \times 60}{33.000} = 9.6$ horse power upon 12 horse power expended, which is equal to 80 per cent., a much higher result than could be obtained by using ropes.

The depression of the barometer, while the piston was going at this rate, was equal to from 18 to 20 inches of mercury. This corresponds to a weight of 294 lb. whereas the weight lifted was only 264 lb. The difference, 30 lb, is, therefore, the amount of friction produced in the tube, causing about 10 per cent. loss. This is very small, especially as the friction increases with the size of the tube. The weight of 264 lb is thus divided:

Piston, 32 lb.; cage, 37 lb.; empty tubs, 9 lb.; load, 186 lb. Total—264 lb.

With a tube of 63 inches diameter, and a section of about 21½ square feet, or 3,117 square inches, the weight lifted would be divided as follows:

Piston	5,000 lb.	Empty tubs	5,000 lb.
Cage	6,450 "	Coal	10,000 "
Total			26,450 lb., or 12 tons.

Each lift would raise 4½ tons of coals from a depth of 3,270 feet, and would take about seven minutes, namely:

Changing tubs at bottom	0'30"	Changing tubs at top	0'30"
Lift	3'00"	Descent	3'00"
			7'00"

This would give 8½ lifts, or 38 tons per hour, or 380 tons per day. The quantity could be doubled by having another tube connected with the first, without increasing the power of the engine, which would work with much less resistance in drawing the air from the top of the ascending piston and letting it on to the top of the descending piston, instead of into the atmosphere. The tubes thus arranged would also make the ventilation more regular.

There is nothing in this system to prevent the water being taken from the mine either in the usual way or by substituting water-boxes for tubs, as is sometimes done with ropes. These boxes could be filled by means of a pump before being put into the tube, or the tube might be made without a bottom, and the box lowered directly into the water.

Comparison of the relative cost and advantages of the atmospheric system.

With a single pit of great depth, under all systems, there is an absolute necessity of having some duplicate means of getting at all parts of the shaft in case of accident occurring to the usual means of drawing. To effect this, there must either be a second auxiliary winding engine, which should have the same relation to the large winding engine, as the old whims bore to the horse gin, or the horse gins to the crab engines. This auxiliary engine should in no case be dispensed with, as an accident might happen at any moment which might render it indispensable.

Besides this auxiliary winding engine, which, in the present case, it has been decided to make of from 90 to 100 horse power, the atmospheric system requires an exhausting engine of about 600 horse power, with two cylinders 39½ in. diameter and about 6 ft. 9 in. stroke, working two extracting cylinders of 108 in. diameter and 10 ft. stroke. With regard to the pits at Hottinguer, the relative expense of three different modes of extracting coal may be considered:

1st. With a duplicate pit and winding engine.

2nd. With winding engine and a metal tube, instead of a second shaft.

3rd. With tube and exhausting machinery.

	System.		
	1ST.	2ND.	3RD.
Staging	£ 1,000	£1,000	£1,000
Second pit	20,000	....	....
Auxiliary engine	2,000	2,000	2,000
Guides, &c	2,000	2,000	2,000
Winding engine	6,200	6,200	....
Fan	2,000	2,000	2,000
Tube	....	6,000	8,000
Ropes	4,000	4,000	....
Exhausting engines	....	....	9,000
Total	£37,200	£23,200	£24,000

The system then appears to possess the following advantages, as far as regards the Hottinguer pit:

1st. It enables the pit to be worked five years sooner.

2nd. It increases the ventilation and decreases the temperature of the mine.

3rd. It admits of sinking to any depth.

4th. It saves £2,000 a year in ropes.

5th. It enables more coal to be raised than with ropes.

6th. It allows the whole inside of the pit, not actually occupied with the tube, to be free for repairs and for alterations, making new landing stages, &c.

7th. It utilizes more advantageously the power required to raise the coal.

The above paper is so full in its detail as to require but little remark. It created a good deal of comment among the members of the North of England Institute of Mining Engineers, when brought before them, but the discussion brought out nothing of importance. There are always two questions which present themselves at once where it is proposed to replace any machine, actually doing work, by something new and untried, viz.:

Is the new machine possible?

Will it do the work cheaper than did the old?

The first of these questions has been answered in this case by the experiments given in the above paper; by the successful working, for years past, of the London pneumatic tube, through which the mail matter and parcels are constantly being carried, and through which even passengers have been dispatched; and by the pneumatic hoist which at some of the large English furnaces lifts 500 to 600 tons of stock per day to a height of 80 or 90 feet.

The conditions of a pit differ but little from those of a furnace hoist except in the amount to be lifted at a time, and the length and size of the tube. These are obstacles of a purely mechanical nature that are quite possible of solution. The greater weight merely calls for additional power in the exhausting engines; the diameter of the tube, even were it 10 feet, would present no great difficulty in construction, and where 100 feet of such tube can be worked successfully at a blast furnace, there would be no insuperable difficulty in making it 1,000 or 3,000 feet.

We apprehend, however, very considerable difficulties in its successful application. In the first place the principal economy claimed for it is that it practically provides a second opening from the mines, and thus obviates the necessity for a second shaft. We do not endorse this opinion. A second opening is called for as a means of escape where an accident occurs by which the main shaft becomes impassible. The very accident which was the occasion of the English Government requiring two openings, with at least 10 feet of solid rock between them, for each mine; and such cases as our own *Avondale*, which gave rise to our Pennsylvania law requiring at least 150 feet distance between the two openings, would not have been prevented by having this tube in the shaft.

Should the shaft cave in, it would undoubtedly destroy the iron tube, except it were made so strong as to be exceedingly expensive; and an explosion in the mine would be very apt to destroy the tube—which acts as the upcast—and with its wreck close up the whole shaft, so that it would, under certain circumstances, become a positive source of danger instead of a means of safety. We do not consider any deep mine safe that has but a single outlet, and this tube cannot be considered as a separate opening in this sense.

There will doubtless be found great difficulty in keeping the tube perfectly circular in section, if it be built of plate iron, as is proposed, and of great diameter. Of course, the cage and pistons must be guided; but the leakage of air at the joints and through irregular tins in the shape of the section of the tube would require in actual practice a considerable margin for waste, which was not, probably, found necessary in the experimental tube, so that the useful effect obtained would be less than these results would indicate.

There would be no difficulty in keeping a sufficiently true allignment of the tube, and by increasing the number of pistons the loss from irregularities (leakage) could be reduced.

As a means of hoisting from great depths, this certainly offers a solution of a great difficulty, for the depth at which hoisting with ropes is practicable is comparatively limited, and at even very moderate depths the weight of the hoisting rope greatly exceeds that of the coal to be lifted, as will be seen from the following figures:

	Steel.	Charcoal Iron.	Hemp.	Chain.
Weight per foot of rope for one ton (2,000 lb.), working load	½ lb.	½ lb.	1⅛ lb.	1½ lb.
Length of rope of uniform section, at which the weight of the rope is equal to its working load	6,000 ft.	4,000 ft.	1,800 ft.	1,000 ft. to 1,200 ft.

That is, at these depths a rope of uniform section would not lift any useful load, but would be fully strained by its own weight, assuming the working strain of wire rope at 1-5th, that of hemp rope 1-7th, and of chains 1-6th the breaking strain.

With taper or conical ropes, of course, these depths would be greatly increased.

For a shaft of 1,000 ft. in depth, an iron wire rope capable of lifting 13 tons (the weight of coal and cages in the example given) would weigh over 4 tons, or nearly the weight of the coal extracted.

Besides the advantage of hoisting only the weight of the mineral, cars and cage, the pneumatic process would largely contribute to the ventilation of the mine, or would give from 10,000 to 12,000 cubic feet per minute, with two tubes of the dimensions given for the Hottinguer pit.

THE ENGINEERING AND MINING JOURNAL.

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IN our report of the Institute proceedings published last week, Mr. BRÜCKNER is represented as saying that his roasting cylinders have a 6-inch lining of brick, and he desires us to say that the thickness is really 3 inches. The former dimension, having been given in reply to a question in regard to the working area of the cylinder, includes the lining on two sides.

A PRIVATE letter received from Mr. WM. M. GABB, now engaged in the exploration of the south-east corner of the Republic of Costa Rica, conveys the gratifying intelligence that, although hard labor, exposure and illness have broken down, during the past year, every member of his old corps, he is himself none the worse for wear, and, having reorganized the survey, expects to complete it in a few months. The results of this important labor will be a topographical map of the region (never before laid down except by surmise); extensive collections illustrating natural history and ethnology; vocabularies of all the Indian languages, and full notes on the geology, both scientific and economic, of the country. This region has never before been entered, we believe, by a scientific explorer. The inhabitants have had the reputation of fierce savages; but Mr. GABB reports that he has found them quiet and friendly. We shall expect some day from his ready pen a popular as well as scientific account of his discoveries and adventures. We note, by the way, his excellent paper on Santo Domingo, which is published in the Transactions of the American Philosophical Society of Philadelphia.

WE notice in the *Penn Monthly* for March Professor LESLEY'S capital address on the Utility of Government Geological Surveys. Perhaps no one else could display such a combination of scientific and literary learning as is shown in this interesting and convincing speech. We regret that the crowded state of our columns prevents us from quoting it; and we trust that it will have upon the Legislature of Pennsylvania the effect of securing the adequate endowment of a new and thorough survey of the State. The volumes of ROGERS, though deserving of much praise, were certainly, in many respects, always defective and are in other particulars already out of date. As Professor LESLEY remarks, the old survey was little better than a magnificent sketch; a foretaste of what could be done; the groundwork of future explorations. One half the State—then a forest, now well settled; then without roads, now cross-barred with railroads—has never been surveyed at all. The whole outcrop of the fossil iron-ore, the Adams and York County ore regions, and the gold, chrome and serpentine region south of Chester Valley, all require to be studied. The entire relations of the State to the iron manufacture have changed by reason of the advance in the value of the bituminous coal and the introduction of high-stack hot-blast coke and anthracite furnaces. Moreover, petroleum was discovered long after the old survey was stopped; and this fact alone is enough to require a new survey. Not one of the one hundred counties of Pennsylvania has a geologically colored map; and a survey which shall provide people with a small, cheap and handy atlas showing accurately the mineral resources of each county will certainly not be superfluous or fruitless of good. Finally, if the survey is reorganized, there is just one man in Pennsylvania who should be at the head of it; and that man, we need not say, is J. P. LESLEY.

The Colorado Desert.

WE note with favor a proposition to reclaim the Desert of the great Colorado of the West to fertility, by means of irrigation from the river. Senator JONES of Nevada, is, it appears, in possession of the results of late examinations by the engineers, Messrs. JAMES and STRETCH, and is about to propose to Congress a survey of the entire region. It would be a good thing to do, especially if it should result in giving to the country an area of rich cotton-growing and sugar lands equal to a good-sized State.

The preposition is received with some incredulity by a portion of the press; which is not strange, considering the general ignorance of the remarkable topographical and climatic conditions of that region. The existence, at the head of the valley of the Gulf of California, of a vast area of deep soil having all the elements of fertility, except moisture, was made known as early as 1854 by W. P. BLAKE, the geologist of WILLIAMSON'S expedition in the mountain passes of California. The whole subject, including the possibility of irrigating the surface from the Colorado, is elaborately discussed in his report to the government, contained in the fifth volume of the Pacific Railroad Surveys. Barometrical observations taken by him showed that a large part of the area is below the sea-level; and he pointed out the fact that the waters of the gulf must formerly have extended some 175 miles further inland than they now do, and that the region must have been shut off from the sea by the delta of the Colorado.

This gave a great fresh-water lake, receiving the fine silt of the Colorado for a long period of time, and which finally dried up, leaving a deep and fine alluvial soil, now the desert surface. It was observed that wherever water flowed over this soil the vegetation was peculiarly rank and dense. An analysis showed an abundance of the essential ingredients of a fertile soil, including potash, soda and phosphoric acid. The Indians in the northwestern end of the desert raised crops of corn, melons and barley by means of local irrigation from springs.

To render that interior valley fertile would not only give us a great region suitable to the growth of cotton, grain, tobacco, and perhaps sugar cane, but it would greatly stimulate mining industry along the Colorado, in Southern California, and in Arizona. It would doubtless favorably affect the climate of the southern counties of California; and in many points of view the subject invites attention.

We are constrained to doubt, however, the feasibility of extending the system of irrigation as far as Death Valley, a great distance to the north, and supposed to be shut off from the valley of the Colorado by rocky ranges. Some new and interesting information regarding this point, hitherto obscure, may, perhaps, be in store for us in the report of the engineers, which we hope will soon be forthcoming.

The alternative scheme of restoring the Colorado Desert to the Gulf of California, or, in other words, inundating it with salt-water, instead of fertilizing it with fresh water, may have greater feasibility to recommend it, though it involves a sacrifice of the possibilities of productiveness in the region itself. BLAKE points out that by deepening the channel of New River, or cutting a canal so low that the water of the Colorado would enter at all seasons of the year, a constant supply could be furnished to the interior of the desert, and that it might cause the bed of the ancient lake to be refilled, and permit navigation from the gulf to the base of the Bernardino Pass. He says that carefully conducted surveys by the *level* are essential in order to ascertain the extent to which this may be accomplished, for, though the barometer is valuable as indicating the heights and differences of level in a general way, the most accurate and delicate instruments are requisite in this case. The belief is expressed that water can be obtained by artesian borings, so as to give running streams at certain points. It is surprising that this has not yet been put to the test. It could be done with comparatively small outlay.

Tests of Two Pumping Engines.

IN the City of Providence, Rhode Island, there are two pumping engines, one designed by H. R. WORTHINGTON, of this city, and the other by GEORGE H. CORLISS, of Providence, well known in connection with the Corliss engine. The Worthington engine has been in use for some time, doing a regular duty of pumping about five million gallons of water every twenty-four hours, into a reservoir 180 feet above the source of supply. The Corliss engine was designed for variable duty, being intended to keep a constant supply in the main, under fluctuating demand. The latter engine has been recently completed, and a competitive test was made of the two machines, according to the terms of a contract between Mr. CORLISS and the Water Commissioners of Providence. In this contract, it is provided that the engine shall be capable of raising with ease 5,000,000 gallons of water in 24 hours, to a height of 120 feet; that it shall be capable of working smoothly when delivering only 1,000,000 gallons in 24 hours; that when com-

pleted, the engine shall be tested to determine its value in comparison with the Worthington engine, (when delivering 2,000,000 gallons of water in 24 hours), in regard to durability, economy, and adaptability; that $34,000 shall be paid for the engine if it appears that it is equal in value to the Worthington engine, and such further sum as shall amount to the estimated annual saving of the Corliss over the Worthington engine, in 10 years, if any such saving be apparent; but that if it is found that the Corliss engine is inferior to the Worthington engine, it shall be removed by the contractor, without any claim for compensation.

A board of experts having been appointed, proceeded to make a series of tests with the two engines. A synopsis of their report is given below.

Each engine was tried for 48 hours, performing the work of raising 2,000,000 gallons of water 88 feet high in 24 hours. As a result of these tests, it appears that the Corliss engine raised 342.49 gallons of water, by the consumption of 1 pound of coal, or gave a duty of 25,176,384 foot-pounds,* which would correspond to a cost for coal, per annum, of $7,352. The Worthington engine raised 707.11 gallons of water by the consumption of 1 pound of coal, giving a duty of 50,574,955 foot-pounds, corresponding to an annual cost, for coal, of $3.680.

In these tests, the amount of water raised was determined by measuring the discharge over a weir—and it was found that the difference between the actual delivery of the pumps, and that calculated from their capacity, was 3.36 per cent. in the case of the Corliss engine, and 2.51 per cent. for the Worthington engine. In the other tests, the delivery was calculated from the capacity of the pumps, without making any allowance for lost action.

Each engine was next tried at a very low rate of speed—the Corliss engine giving a duty of 8,487,370 foot-pounds, which would make the cost of coal, per annum, $5,208 58; the duty of the Worthington engine being 36,878.346 foot-pounds, corresponding to an annual cost of coal of $1,277 50.

A further test was made, to see if each engine could raise the full amount of water called for by the contract. This being the work for which the Worthington engine was specially designed, it might be expected to show a higher rate of duty—but the experts decided, in making this test, to take no account of fuel—and merely state that they are satisfied that both engines have the necessary capacity for raising 5,000,000 gallons of water a day.

It may be interesting, in this connection, to show the performance of other pumping engines, and we select a few, as published in the *Journal of the Franklin Institute*, for January, 1874:

	Duty in foot-pounds.
Engine at Belmont	54,416,694
" " New Bedford	59,336,497
" " Brooklyn	72,000,000
" " Lowell	93,002,272
" " Lynn	99,428,000

So much for the relative economy of the two engines; the Worthington engine requiring about half as much fuel as the Corliss, on the 2,000,000 gallon test, and little more than one-quarter, at the very slow speed.

It is stated by the experts, that a considerable noise was produced by the Corliss engine, at high rates of speed. The Worthington engine worked very smoothly, and almost noiselessly, at all rates of speed, and no expansion or contraction of the sides of the pumps could be noticed, as in the case of the Corliss engine.

We believe that we have given all the essential features of the experts' report, and our readers will hardly be prepared to hear that they decided that the full contract price should be paid for the Corliss engine, and two of them fix the money value of the superiority of the Corliss engine at $21,000, and recommend that this additional sum be paid. If we were to stop here, most persons would probably conclude that these experts were either ignorant or corrupt—men who could not, or would not, understand the results of their own tests, in establishing their conclusions. Our readers' surprise will probably be equal to our own, when they are informed that the experts who made this test are generally considered to stand in the foremost rank of the profession, both in regard to character and ability. The board was composed of ERASTUS W. SMITH, FREDERIC GRAFF, and GEORGE H. REYNOLDS. We do not know that we can explain the motives, which prompted the recommendations, made by these gentlemen; but those who have observed the course of political affairs, of late, have probably noticed similar action on the part of investigating committees composed of men of the highest reputation, who have been induced, by charitable feelings, or considerations of political necessity, to render "white-washing" reports.

* The duty of a pumping engine is the number of pounds of water raised one foot high, by the consumption of 100 pounds of coal.

CORRESPONDENCE.

Blast Furnace Repairs at Dunbar—Value of the Ammonia Antidote to Carbonic Oxyd Poisoning.

AT the recent meeting of the Institute of Mining Engineers it was stated that hartshorn was a remedy, in case of poisoning by carbonic oxyd gas. Mr. COXE expressed the opinion that what is known as "white damp" in mines was carbonic oxyd, and considered the statement made as to hartshorn so important as to warrant the fullest possible notoriety through the columns of the JOURNAL. On the very day that the discussion was taking place, a practical test of the value of this remedy was had at Dunbar Furnace, Pa.

The brick work under the hopper, and for some distance down, was so worn away by the constant striking of the raw stock during three and a half years as to endanger the safety of the bell and hopper. It was necessary to take them out, a very laborious and dangerous job, owing to the presence of the gas. During the work, the men were all more or less affected, some very much more so than others. The founder, Mr. HEALEY, it seems, was fully posted as to the merits of hartshorn, and had provided himself with a bottle of it. As soon as a man was affected, a strong whiff at the bottle would almost instantly restore him, removing the dizziness, head-ache and sickness of the stomach, and enabling him to continue his work.

It may not be uninteresting to some of your readers to know how a furnace in blast can be repaired.

The first point to be ascertained is how far down the walls need rebuilding. In this instance we kept the blast on, until the stock had sunk some 25 feet. The taking out of the bell and ring followed, and this was the dangerous part of the operation, as there was an intense heat and an unobstructed emission of gas. It was during this part of the work that the men were most affected.

It was found that on one side the walls were badly cut about 18 feet down, and on the other sides about 10 to 12 feet. Below these points the walls were as perfect as the day they were put in. One round of coke, ore and limestone was charged as usual; on this six barrows of coke (3,000 lb.); resting on this was a piece of 16 in. pipe running above the top of the furnace; around it was piled a lot more of coke, and on top six cart loads of fine ore dust. When this was done, the work proceeded rapidly, and without trouble; every particle of the gas was carried off through the pipe, which was red hot all the time. The entire lining down to the points mentioned was torn out, and 17,000 bricks reset.

The fire-clay was boiled with a barrel and a half of salt, and the bricks dipped into a thin grout of the mixture, and hammered firmly into their places. When the walls were done, the fine ore dust was shovelled off and taken out, the pipe removed and the hopper and bell reset, the whole operation, from the taking off of the blast to starting, occupying three days and a half. Owing to the fluidity of the grout, and the care taken in setting the bricks, there has not been a particle of settling, and the salt has given a fine glaze to the new walls. The bricks used were ordinary 9 in. fire brick (the only kind we use in lining the furnace), alternating head and stretcher, and tied together in each course. E. C. P.

DUNBAR, March 12, 1874.

The Lake Superior Tin Swindle.

THOUGH this subject has already passed into the historic phase, yet the perpetrators of the "swindle" have not been generally known, nor has the inside history of the job come to light. We therefore publish the following letters from reliable gentlemen, who have had means of knowing the facts whereof they speak, with the hope that it will aid in exposing the principals, and, by making the means employed more public, will prevent the success of similar swindles in the future:

DETROIT, Jan., '74.

I was one of the party who visited the tin lands last year. Mr. GILLANT, one of the original discoverers, was with me, and he was confident, when we left Detroit, that he could show the deposits, but when he got into the land he either could not, or would not, show anything. He appeared perfectly befogged the moment he got into the woods.

I spent about three weeks tramping over the lands trying to find some traces of the former explorers. All I could find was the salted veins near Otter Head. I saw a great many veins on the property, but none that had mineral enough in them to warrant any expense on them. On my return home I made assays of the vein matter, and found the best result was seventeen dollars silver to the ton, from another twelve dollars gold per ton, but no trace of tin.

The property is large and has two good harbors, but it is the roughest land on Lake Superior, with about all the known rocks. I have little doubt that the property possesses mineral value, but, so far as I have seen, it is yet to be discovered by exploration. This, you know, takes money. The Pool have no way to raise money; what will be done with it is hard to say.

There was a proposition made to Mr. PENNOCK to deposit twenty thousand shares of stock to be delivered to him when he showed tin in veins *in place* on the property. He wanted the stock, or a part of it, delivered this winter. This is of course, was declined by us. If he was sure he could show what he says he can, it does seem to me that he would not decline such an offer. I am willing to acknowledge that he is past finding out, and has little regard for his word.

GEORGETOWN, COL., Jan. 5, 1874.

TO THE EDITOR—Sir: In your issue of the 23d ult. I notice a communication and editorial regarding a "tin" swindle. While I was in London, early in the fall of 1872, a man by the name of WOODS came to my apartments in London with a letter of introduction from an American friend of mine, then in that city. He desired me to accompany him to Truro, for the purpose, as he said, of selecting a ton or two of tin ore for him, which he desired to ship to America. I asked his purpose, which he refused to disclose, and I also refused to accompany him, although he offered me a large sum of money. I heard no more of him until some two months since, when a friend of mine, who had been East, returned and asked me if I had heard of the big tin swindle on Lake Superior. I told him I had not. He then said a man named WOODS had made $300,000 out of the swindle. My friend saw him in Chicago. I told the circumstances of my meeting a man of the same name in London, also what he required, and gave him a personal description of the man. My friend said the description tallied exactly with the person calling himself WOODS, whom he met in Chicago, X.

Explosion at Dunbar Furnace.

CONCLUDED FROM PAGE 177.

satisfactory in one sense, as it showed us that we could make white iron, if it was absolutely necessary, but at a very great cost.

The query now presents itself—why was there an explosion? The furnace was never in better condition; working with perfect regularity, the suspected tuyere *was not* leaking because it went back, and is now in use. The dampers were raised as usual when the blast was off, the gas flue leading to the boilers was open, leading into a stack 116 feet, and of course with a powerful draft. There were valves in all the tuyere stocks; three were turned, but there is no doubt but that the front tuyere stock was open. The gas must have gone back through this opening (only 6" pipe) through the hot blasts and long 30" pipe, doing no damage until it reached the receiver, and then doing all the damage it could. But that it should have gone backward through this small pipe, when it had 90 inches of openings at the top of the furnace, must, among all fair minded people, be considered a vagary.

Another point is worthy of note. Our gases not having given us enough heat under our boilers, some three weeks before the explosion, we had been using a small shovel-full of raw coal with each barrow of coke; this we found to work admirably, giving us great additional heat both under the boilers, and in the hot-blast ovens. Whether this small amount of coal, which certainly must have given off all its gases in the upper part of the furnace, had an influence in producing the explosion, must be decided, if decided at all, by others.

It is usual to shut the stable door after the pony has gone, so we have put in two of TAWS & HARTMAN'S automatic valves, of sufficient capacity to let off the gases from two furnaces. If therefore a blow-up is arranged for the future, the furnace will have to go, and not the receiver.

The moral of this story is, if you run a furnace, and haven't an automatic valve, go right home and put one up anyhow, to let off the gas, and as many more as you think necessary to make you feel perfectly at ease.

The Coals of the Hocking Valley, Ohio.

BY DR. T. STERRY HUNT.*

BUT little was known of the coals of Southeastern Ohio until the present survey of the State under Dr. NEWBERRY began its work. The results of the geological investigations of Prof. E. B. ANDREWS in this region, and of the chemical investigations of Prof. T. G. WORMLEY, both of which appear in the reports of the survey for 1869 and 1874, and more recent special reports by the former, together with some data for which I am indebted to the kindness of Dr. NEWBERRY, and my own limited observations, have served me for the preparation of the following notice of the coals lying on the western border of the great Appalachian coal basin in the region drained by the Hocking River and its tributaries, and belonging to the Lower Coal Measures. Some uncertainty exists as to the place in the succession of the lower coals to be assigned to the seams known and mined in the Hocking Valley. It is the opinion of Prof. ANDREWS that the inequalities of the original surface were such that we cannot identify in that region the lowest coals known in Northwestern Pennsylvania and the contiguous parts of Ohio, but that we must rather count from above downwards. These conclusions Dr. NEWBERRY is not prepared to accept, and further researches will be necessary before certainty can be attained in this matter. Meanwhile it seems, from a study of its relations to the Pomeroy or Pittsburgh seam, that what is known as the *great vein* of the Hocking Valley, occupies the horizon of the Upper Freeport coal, E of the Pennsylvania survey, or No. 6 in Dr. NEWBERRY'S enumeration, counting from the base. This seam, in the region in question, assumes certain characteristics which, taken in connection with its geographical position, give it a great importance among the coals of the State. The area to be noticed includes the whole or parts of several townships in Perry, Hocking, Vinton and Athens Counties, lying near the margin of the basin over which the vein in question assumes the character of a dry-burning or splint coal, and has a thickness varying from six to ten and even twelve feet. Its precise limit southward cannot at present be clearly defined, but it has been found as far south as the line of the Marietta and Cincinnati Railroad, with a thickness of six feet, and is mined at various points along the valley of the Hocking River, near Nelsonville, where it attains six or seven feet. To the northward, along the tributaries of this river, Sunday and Monday creeks, and Snow Fork, a branch of the latter, it attains its maximum of from ten to twelve feet, but approaching in this direction the line of the Cincinnati and Muskingum Valley Railroad, it diminishes to about four feet and loses its importance. Over the greater part of the area in which this coal is known it lies above water level, and is exposed in the sides of the valleys occupied by the tributaries of the Hocking, viz., those mentioned above on the north side, and Floodwood Creek and Meeker's Run on the south. The strata have, however, a gentle and nearly uniform dip of about thirty feet to the mile a little south of east, and this carries the great vein below the water level in part of Monroe and in Trimble, Dover and Athens townships. To the east of these, little or nothing is known of the great vein; some 300 or 400 square miles are, however, shown to contain this seam in its exceptional development as to quality and thickness.

There are two other seams of coal exposed over parts of the area which demand notice; one of three or four feet, which is found about thirty feet below the great vein, is mined to a small extent at some points, and is found to be a good caking coal, while a third seam, about seventy feet above the great vein, is known in parts of this region as the Bayley's Run or Stallsmith coal, and is very persistent, with a thickness of four or five feet. It is mined to some extent in several places, and is valued as a steam coal and for domestic uses. According to Dr. WORMLEY, it is a good gas coal, and moreover yields a firm and compact coke, which may become important for metallurgical purposes. This seam is, according to Dr. NEWBERRY, No. 7, and lies above the Mahoning sandstone in the so-called barren measures. Still another seam, with a thickness of three feet, is seen in some parts a little above the last; but these lesser seems, with the exception of No. 7, are not likely for the present to attract attention.

The great vein, as it is called, is also designated the Nelsonville or Straitsville seam, and the coal extracted from various parts of it is known in the markets by the name of Hocking-Valley, Brooks's, Lick Run, Straitsville, Shawnee, Sunday-Creek, and Lyonsdale coal. It is, as already stated, dry or free-burning, without any tendency to cake, and closely resembles the so-called block coals of Mahoning and Columbiana Counties, represented by the fomous Briar-Hill coal. The name of cannel is sometimes applied to it, but incorrectly, for it belongs to what is often called splint coal, a term which may be conveniently applied to all dry or non-coking coals, intermediate in physical properties between coking coals and true cannels. While resembling the latter in their manner of burning, they differ in yielding much less gas and volatile matter, and a proportionally larger amount of fixed carbon, which gives them a greater heating power than cannel.

Although the coals of the great vein, from different parts of the region under consideration, are locally supposed to offer considerable variations in quality, they resemble each other closely in aspect, mode of burning, and, as will be seen, chemical composition. I give from Prof. WORMLEY'S report several analyses:

Nos. 1, 2, 3 are from Brooks's bank, near Nelsonville, in the southern part of the field, where the coal has a thickness of only six feet, and represent the lower, middle and upper portions of the bed.

Nos. 4, 5, 6 and 7 are from New Straitsville, further northward, where the seam measures ten feet, and are taken from four points from bottom to top.

No. 8 is an average of the analyses of 27 samples from Upper Sunday Creek toward the northeast part of the field, where the bed attains its maximum thickness of twelve feet.

HOCKING VALLEY COALS—ANALYSES BY PROF. WORMLEY.

	1.	2.	3.	4.	5.	6.	7.	8.
Water	6.20	6.65	5.00	7.70	7.40	7.20	5 30	5.34
Ash	2.70	1.90	9.05	2.60	2.95	5.15	7.95	5.09
Volatile combustible matter	31.30	33.05	32.80	30.70	29.20	30.10	31.00	31.40
Fixed carbon	59.80	58.40	53.15	59.00	60.45	57.55	55.75	58.17
	100.00	100.00	100 00	100.00	100 00	100.00	100.00	100 00
Sulphur	0.97	0.41	0.44	0 49	0.93	0.57	1.18	0.88
Sulphur left in coke	0.08	trace	..	0.08	0.02	0.26	0.08	..

This coal, from its free-burning quality, is found to be well fitted for the blast furnace, and that from New Straitsville has been used to some extent at Cleveland as a substitute for Briar Hill, with a mixture of from one-fourth to one-seventh of coke. It is not, however, quite equal as a furnace coal to those of the Mahoning Valley, which yield from 63.0 to 66.0 per cent. of fixed carbon, and consequently the consumption of the Hocking Valley coal to produce a ton of iron will be somewhat greater than of the last. On the other hand, the coals of the Mahoning Valley contain, according to WORMLEY'S analyses, more sulphur, and retain a much larger proportion in the coke. The Hocking Valley coal from near Straitsville has now been used for four years in a blast furnace at Columbus for smelting a mixture of foreign and native ores, with great success, and a second furnace for its use has lately been put in blast at the same place, besides which it is employed in a third blast furnace at Zanesville, while a fourth is now being built near Shawnee. In these furnaces, also, it is generally used with an admixture of coke. As a gas coal, it is found much superior to that of Youghiogheny, and has replaced it in the gas works of Columbus and Newark, its gas having an illuminating power of from seventeen to nineteen candles. For generating steam, for puddling iron, and for general purposes, this coal has met with great favor, and is now largely exported to various points. In Chicago the coal from Brooks's mines, on the banks of the Hocking, is now quoted at the same price as the Briar Hill coal, while in Indianapolis it commands a higher price than the block coals of Indiana. This coal is now shipped in considerable quantities to New York, where it is much esteemed; and is sold at a high price under the name of Straitsville cannel. Its combustion in the grate resembles that of hard wood, and its heating power is greater than that of true cannel.

If we look to the future coal trade of the West, we find that the supplies of the valuable furnace coal of the Mahoning Valley are limited. It occurs in small detached basins, and is mined under conditions which enhance greatly its cost. As we go southwestward along the margin of the coal field this coal disappears, and we find little else than coking coals which are, for most part, highly sulphurous, until we reach the Hocking Valley with its great vein of splint coal. Under these conditions it is difficult to over-estimate the importance of this region to the rapidly growing industries of the West. The anthracite of eastern Pennsylvania owes its importance not only to its exceptional qualities, but to the fact that it lies on the northeast border of the great Appalachian coal field, having before it, to the north and the east, states destitute of coal, but rich and populous, and abounding in valuable ores of iron, which find in the anthracite the only available fuel for smelting them. In like manner we find on the northwestern border

*A Paper read before the American Institute of Mining Engineers, February 26, 1874.

of the same great coal field the Hocking Valley coal, having to the north and west the vast coalless area of Ohio, of Ontario, Michigan, Wisconsin and in great part Indiana and Illinois. The movements of trade are such that in 1872 Chicago received 834,000 tons of coal (out of 1,308,000 tons, its total importation) from Pennsylvania and Ohio; of this a considerable portion came from the Hocking Valley. I find that in 1873 not less than 800,000 tons of the splint coal from the great vein were carried over the Hocking Valley R. R. to Columbus, besides about 300,000 tons over the newly opened railroad which now runs from Newark to Shawnee. Of all this coal, a large part found its way to Sandusky, the nearest lake-port, for shipment. The continuation southward of the railroad just mentioned, and the lines in progress, will very soon open this region more completely, putting it in more direct communication both with the lake-ports and with Cincinnati. The cheapness and facility with which the coal of the great vein can be mined, its peculiar qualities, fitting it for a wide range of applications, and its geographical position, all combine to give a high importance to the Hocking Valley region, on wich a great part of the northwest must, to a large extent, rely for its supply of fuel for many years to come.

The native iron ores in this region and its vicinity are abundant, and for a long time supplied several charcoal furnaces, previous to the use of the splint coal as a fuel for smelting. With the development of the export trade in this coal, it may be confidently expected, that a large portion of the iron ores of Lake Superior and of Missouri will find their way as return freights into this region, to be smelted with the raw coal, so that the Hocking Valley may become one of the great centers of the iron industry. It borders on the north the well-known Hanging-Rock region, so long famous for its iron smelting, in parts of which, as in Jackson County, valuable furnace coal is now found, and successfully used for smelting the native ores.

The iron furnaces of the Mahoning Valley, and of other parts of Ohio, have hitherto been dependent upon Connellsville, Penn., for the coke required to mix with the raw coal for smelting purposes, but there seems little doubt, from the trials of Prof. WORMLEY, that the coal of the Bayley's Run, or four feet seam, which overlies the great vein of the Hocking Valley, will afford a superior coke. It yields on an average over 58·00 per cent. of fixed carbon, and less than 4·00 per cent. of ash, while the coke, which is hard, compact, and metallic, retains about 0·75 per cent. of sulphur. The manufacture of a good quality of coke would add greatly to the industrial and commercial resources of the Hocking Valley.

I cannot conclude without calling attention to the fact that it is almost wholly due to the work of the present geological survey of Ohio that this important coal field has been made known, and without bearing testimony to the careful and painstaking field work of Prof. ANDREWS, and the chemical labors of Prof. WORMLEY, who has probably given us the most elaborate and important series of investigations yet undertaken of the chemistry of American coals. The appearance of the final report on the Economic Geology of the State, which, it may be presumed, will embody his complete results, will be awaited with much interest.

DISCUSSION.

MR. PECHIN inquired whether Dr. HUNT had observed any change in the amount of sulphur, or in its state of combination in which it existed in coals, as the workings were carried in further from the outcrop and the vein got under heavy cover. He knew nothing of the kind in the Ohio field, but Mr. MORGAN, who had been at great expense in building coal-washing machines near Irondale, had met with an occurrence of this kind. His machinery was built to wash a coal which was very rich in pyrite, and was a perfect success. But as the mining progressed in from the outcrop, the character of the sulphur compound changed. The pyrite disappeared, and the coal contained as much sulphur as ever, but in some state of combination which was not yet understood. At all events it eluded the efforts of the washing machines, which had now been abandoned with great loss. He desired to know if Dr. HUNT had ever observed a similar change in the sulphur in coal, and how he would explain the phenomenon.

Dr. HUNT said that no case of the kind had come under his observation, and he very much doubted if the sulphur ever changed its condition. If it occurred in two states in the coal it was probably found in those states in the beginning, and had maintained a dual existence ever since. He doubted the possibility of any alteration of pyrite to carbonaceous compounds of sulphur, and pointed out that the sulphurous hydro-carbons were not at all likely to be affected by the infiltration of iron solutions.

MR. HEINRICH thought that sulphur may frequently take the form of gypsum. He had seen both the roof and the coal itself full of selenite crystals, and the fine scales seen in anthracite might be the same mineral.

The PRESIDENT made a few remarks upon the very valuable work done in regard to the presence of sulphur in coals by the Missouri geological survey, a worthy compeer of the Ohio work. Though still incomplete, one volume of the report is finished, and contains many valuable researches on this subject.

ON the Supplement published last week, the address of the Ingersoll Rock Drill Company was printed "229 Broadway;" it should have been 239 Broadway, and we desire our readers to notice the correction. The address was correctly given in the article accompanying the Supplement.

TRADE REVIEW.

NEW YORK, March 20, 1874.

During the past week, the stagnation in business which has obtained since October last, was unbroken by any transactions in either coal or iron worthy of note. Business is reviving very slowly, or it may be, not at all, for though money is abundant in the great centers, and is actually begging for investment, good business paper finding accommodation at 5 and 6 per cent., and call loans having been made as low as 2 per cent., yet collections are reported as even more difficult than during "the panic." There appears to be no desire to make permanent investments among those who have money, and this is, doubtless, due largely to the uncertainty that exists as to the action of Congress on the currency question, though even with that point settled, those branches of industry of greatest interest to our readers—the iron and coal trades—will not at once revive. The crystallization of the anthracite trade in the hands of the Combination leaves but little to record in that branch of industry. The prices to be paid at New York for every week and month of the season are perfectly well known to our readers, and our reports, if confined to this article and to New York, might almost be stereotyped in advance; but the general movement of coal in the direction of manufacturies as indicating, better than any other sign, the resumption of business throughout the country, is of the greatest interest, not to coal dealers alone, but to merchants in every branch of business. When we have to report, week after week, that there is little demand for immediate delivery of coal to our manufacturing centers, there is no concealing the fact that business has not revived at its sources.

Shipments.—The quantity of Anthracite mined for the week ending March 14th, was 310,825 tons, as against 286,570 tons the previous week. A large portion of this goes into stock at the tide water shipping ports, for even this moderate production is more than sufficient for the needs of the market. At Port Richmond, the receipts of coal were 37,500 tons, the shipments 16,500 tons, and the stock on hand 76,500 tons. At Amboy, the receipts for the same period were 15,660 tons shipments 12,222 tons. The Delaware and Hudson Canal Co. sent 13,000 tons of coal to tide water and has now a stock at Wehawken of about 20,000 tons, at Rondout about 60,000 tons, and at Honesdale some 400,000 tons. The Lehigh and Wilkesbarre Coal Co. reports about 40,000 tons at Port Johnson, and the other companies have large stocks, though many of the mines have been idle for some time past.

The opening of the Hudson River will create a brisk movement of coal from Rondout and Newburg. Within the past few days the Pennsylvania Coal Company has dispatched some 250 barges to Newburg.

The *Committee of Six* has decided on curtailing production, or rather, we should say, shipments to competitive points, for the month of April to 15 per cent. below the standard quota on the ten million basis, as explained in the companies' circular. The Lehigh and Wilkes-Barre Coal Company commenced work yesterday (19th) at most of their mines in both the Lehigh and Wyoming regions. Not having sent their proportion of coal to market during the past month, they propose making up this deficiency.

The regular monthly auction sale of Scranton coal is advertised in another column; 60,000 tons are offered on the usual conditions.

In the bituminous trade no movement has yet been made. In fact, prices for freights are not yet all fixed; those that have been decided on up to the time of our going to press are given under the appropriate heads in another column. The market is still supplied with the stocks standing over from last Fall, and the trade in this branch will certainly open fully a month to six weeks later this season than it usually does.

Prices.—The prices for anthracite for the month of April have been fixed to-day; they are the regular programme rates of *five* cents above March prices.

APRIL PRICES FOR ANTHRACITE F. O. B. AT TIDE WATER.

	Lump.	Str.	Grate	Egg	Stove	Ches.
Wilkesbarre, - -	4 60	4 70	4 80	4 95	5 40	4 40
Lackawanna (D. & H. C. Co.)	—	—	—	—	—	—
Lehigh Coals (Hazleton),	5 40	5 35	5 35	5 35	5 50	4 55
Schuylkill, - - -	—	—	—	—	—	—

The Pennsylvania Coal Company's prices for coal to be delivered in April are: Lump, $4 30; steamer, $4 30; grate-$4 40; egg, $4 50; stove, $5 00; chestnut, $4 15; small Chestnut, $3 20, per ton.

These prices are made at Newburg, from which place to New York the freight is 65 cents per ton. This addition brings Pittston coal about the price of Wilkes-Barre and Lackawanna coals at Elizabeth.

The Delaware and Hudson Canal Company allow 20 cents per ton on coal taken at Rondout, and this would make it and Pittston at Newburg about the same in price.

There has been a rumor, which, however, we believe to be entirely unfounded, of a mixing of some of the standard coals, and selling under the name of that which brings the highest price.

The latest market rates for coal and freights will be found in detail in another column, under their appropriate headings. These lists are revised every week with the greatest care, and are arranged so as to give the largest possible amount of information in the smallest and most convenient form.

We commend them to the attention of our readers.

WAGES in the Schuylkill Region to be paid for the month of March, have been fixed at 6 per cent. above the $2 50 basis, the average price being within a fraction of $2 67 per ton.

THE Philadelphia and Reading Coal and Iron Co's. Premiums for the Preparation of Coal.

CIRCULAR.

The comparative statement showing the proportion of coal mined during 1873 by the companies' collieries, and those whose product was sold by the company, is now in course of preparation; by it, it appears that the following collieries are entitled to the premiums.

No. 1. Phœnix Park No. 2 Colliery, production 7,512.12 tons and will receive $751 21.

No. 2. Otto Colliery; production 69,889.03 tons, and will receive $6,988·90.

No. 3. Bast Colliery; production, 66,757.19 tons, and will receive $3,337 85.

Owing to the fact that the colliery entitled to the first premium only shipped 7,512.12 tons, it has been determined to award the first premium of ten cents per ton to the second best also, and the second best to the third best. A distribution of the awards will be made to the proper parties as soon as the accounts can be made up, at which time the whole statement will be made public. WM. KENDRICK, Mining Supt.

COAL PRODUCTION.

Anthracite.

Mined for the week ending March 14, 1874.

	WEEK. tons.	YEAR.* tons.
Wyoming Region.		
Delaware and Hudson Canal Co	53,667	395,797
Delaware. Lackawanna and Western RR.	37,819	419,070
Pennsylvania Coal Co	21,902	210,368
Lehigh Valley R.R	16,483	179,632
Pennsylvania and New York Railroad	....	9,185
Central Railroad of New Jersey	27,215	166,219
Lehigh Region		
Lehigh Valley Railroad	46,847	496,130
Central Railroad of New Jersey	8,713	94,418
Schuylkill Region.		
Philadelphia and Reading Railroad	91,179	490,989
Shamokin and Lykens Valley	7,000	81,486
Sullivan Region.		
Sullivan and Erie Railroad	....	4,530
Total	310,825	2,548,024

* Year beginning January 1st.

Bituminous.

Mined for the Week Ending March 14.

	Week. Tons.	Year. Tons.
Cumberland and Pennsylvania R.R	22,305	211,023
Cumberland Branch R.R	2,044	21,584
Philadelphia and Reading R.R	4,871	56,143
Barclay R.R	....	35,111
Huntingdon & Broad Top R.R	8,360	76,855
Tyrone Division Penn. R.R	....	111,652

Port Richmond.

	March 14. Tons.
Receipts for week	37,500
Shipments for week	15,500
Balance on hand	76,500

MARKET PRICES OF COAL.

Import Duty on Coal.

Anthracite free. Bituminous, per ton of 28 bushels, 80 lb. to the bushel 75c., gold.

All slack, or culm such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c., gold.

Not otherwise provided for, per ton, 40c., gold.

ANTHRACITE.

WHOLESALE PRICES.† f. o. b. at Shipping Ports.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
‡Scranton at Elizabethport	4 60	4 70	4 80	4 95	5 40	4 40
*Lackawanna	4 60	4 70	4 80	4 95	5 40	4 40
§Pittston at Newburgh	4 30	4 30	4 40	4 50	5 00	4 15
Wilkesbarre at Port Johnston	4 60	4 70	4 80	4 95	5 40	4 40
Newport and Plymouth	....	....	4 80	4 95	5 60	4 40
Susquehanna Coal Co. at Amboy	4 75	4 85	4 90	5 05	5 50	4 50
Lehigh Coals.						
Old Company at Port Johnston	5 55	....	5 50	5 50	5 65	4 70
Old Company's Room run	5 05	....	5 05	5 05	5 40	4 40
Sugar Loaf at Port Johnston	5 55	....	5 50	5 50	5 65	4 70
Hazleton at Elizabethport	5 40	....	5 35	5 35	5 50	4 55
Honey Brook at Elizabethport	5 40	....	5 35	5 35	5 50	4 55
Spring Mt. C. Co. at Hoboken	5 40	5 40	5 35	5 35	5 50	4 55
Beaver Meadow at South Amboy	5 55	....	5 50	5 50	5 65	4 70
McNeal at Port Johnston	5 40	5 40	5 35	5 35	5 50	4 55
Schuylkill Coals at Port Richmond.						
Schuylkill White Ash	4 10	4 20	4 30	4 45	4 90	3 55
Schuylkill Red Ash	....	....	4 45	4 60	4 90	3 80
Shamokin W. and R. Ash	....	....	4 55	4 90	4 90	4 05
N. Franklin	....	....	4 90	4 90	4 90	3 80
Lorberry	....	....	5 05	5 05	5 05	4 05
Lykens Valley	....	....	....	5 80	5 80	4 55

* f. o. b. in New York Harbor.

† Prices for April, as per circulars dated March 20, 1874.

§These are net prices for delivery, during the present month, of coal previously contracted for, and are not rates which the company would now make contracts at.

‡ These prices are for registered contracts. Buyers not having contracts will be charged 15 cents per ton more than above prices.

Scranton sale, Feb. 25, averages: Steamer, 4 52½; grate, 4 53; egg, 4 74; stove, 5 18¾; chestnut, 4 19¾.

Line Prices for March, 1874.

At	Lump and Broken.	Egg.	Stove.	Chestnut.	Pea.
Carbondale	2 25	2 25	2 50	2 00	1 25
Fair Haven New York	6 00	6 25	6 50	6 25	....
Ithica, New York	4 90	4 90	5 40	5 15	....
Mauch Chunk, Lehigh	3 45	3 35	3 80	3 10	....
Mauch Chunk, Newport	2 25	2 25	3 50	3 00	....
Mauch Chunk, Wilkes-Barre	3 24	3 49	3 64	3 24	....
Pittston	2 25	2 25	2 50	2 25	....
Port Carbon	2 75	2 90	3 00	2 25	1 25
Port Clinton, via Canal	2 95	3 10	3 20	2 45	1 45
Schuylkill Haven, via R. R. and Canal	2 83	2 98	3 08	3 33	1 33
Scranton	2 25	2 25	2 50	....	1 25
Wilkes-Barre	2 25	2 25	2 50	2 00	1 25
Waverly	4 75	5 00	5 25	5 00	....

WHOLESALE PRICES.

New York.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals						
Scranton	5 10	5 20	5 30	5 45	5 90	4 90
Lackawanna*	5 10	5 10	5 30	5 45	6 90	4 90
Pittston	4 95	5 00	5 10	5 20	5 70	4 85
Wilkesbarre	5 05	5 15	5 25	5 40	5 85	4 85
Newport & Plymouth	...	...	5 25	5 40	6 05	4 85
Susquehanna Coal Co.	5 25	5 35	5 40	5 55	6 00	5 00
Lehigh Coals.						
Old Company	6 00	....	5 95	5 95	6 10	5 15
Old Co.'s Room Run	5 50	...	5 50	5 50	5 85	4 85
Sugar Loaf	6 00	....	5 95	5 95	6 10	5 15
Hazleton	5 85	....	5 80	5 80	5 95	5 00
Honey Brook	5 85	....	5 80	5 80	5 95	5 00
Spr'g Mount. Coal Co.	5 85	5 85	5 80	5 80	5 95	5 00
Beaver Meadow	6 05	....	6 00	6 00	6 15	5 20
McNeal	5 85	5 85	5 80	5 80	5 95	5 00
Schuylk'l Coals.						
Schuylkill W. A.†	4 95	5 05	5 15	5 30	5 75	4 40
" Red Ash	....	....	5 45	5 60	5 90	4 80
Shamokin W. & R. Ash	....	....	5 55	5 90	5 90	5 05
North Franklin	....	....	5 90	5 90	5 90	4 80
Lorberry	....	....	6 05	6 05	6 05	5 05
Lykens Valley	....	....	....	6 75	6 75	5 50

* Delivered on wharf.

† Alongside.

BITUMINOUS.

WHOLESALE PRICES. F. O. B.

Broad Top	$6 50
Derby	6 50
Kittaning	6 50
George's Creek Cumberland	7 00@7 25
West Virginia Gas	8 75
West Virginia Cannel	14 00
Penn. Gas	9 00
Westmoreland Gas	9 00
Ohio Caking	10 00
Ohio Cannel	13 00
Lyonsdale Coal	12 50
James River Bituminous	7 00
" Carbonite	10 00
Kanawha River Cannel	15 25
Liverpool Gas Cannel	14 00
" House "	20 00
Newcastle Gas	10 00
Cannelton Cannel	15 00
Red Bank Cannel	9 00

RETAIL PRICES.

PER TON OF 2000 LB.

Liverpool House Orrel, delivered	$20 00@$22 00
Liverpool House, Cannel, delivered	20 00@ 25 00
American and Block, delivered	16 00@ —
Straitsville Cannel	16 00@ —

	Grate and Egg.	Stove.	Chestnut.
Pittston Coal, in yard	$5 60	$5 80	$5 00
Delaware & Hudson, delivered	6 60	6 85	6 10
Scranton, delivered	6 75	7 00	6 25
Wilkesbarre, in yard	6 00	6 25	5 50
Lehigh and Locust Mountain, del'd	7 00	7 50	6 50

Georgetown, D. C., and Alexandria, Va.

George's Creek and Cumberland f. o. b. $4 60@4 75, wholesale.

Buffalo, N. Y.

Youghiogheny Gas Coal	$6 00
Catish Lump	4 75
" Nut	3 50
" Nut and Slack	3 00
" Slack	2 85
Connell-ville coke	8 00
Beaver Gas Coal	6 50
Red Bank Cannel	5 50
" Orrel	5 00

Anthracite, per 2000 lb in cars; retail prices, delivered, $1 50 per ton additional.

Lump	$6 50
Grate	6 00
Egg	6 25
Stove	6 50
Chestnut	6 25

Baltimore.

Wholesale Prices to Trade.

Corrected weekly by E. Stabler, Jr., coal merchant.

Wilkesbarre, by cargoes or cars	$6 25@....
Pittston and Plymouth	6 00@....
Shamokin Red or White Ash	6 00@ ...
Lykens Valley Red Ash	6 55@....
Retail, per ton 2240 lb. (all kinds)	7 50@ 8 50
George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 85@5 00
West Va. Gas Coal f. o. b. at Locust Point	6 50@....
Kanawha Cannel, coarse	13 00@....
Tyrone	7 25@....
Ritchie Mineral of West Virginia	19 00@....

Boston, Mass.

English Cannel	$25 00@26 00
do do from ship	22 00
Scotch Cannel	15 00@18 00
American Cannel	14 00@15 00
Lingan	8 25
Caledonia	7 75
Pictou	8 25
Sydney	9 00
Acadia	6 75@ 7 25
Cumberland	7 65@ 8 00
Anthracite, retail	8 75@ 9 00
" by cargo	7 50@ 8 00

Chicago, Ill.—March 16.

REPORTED BY RENO & LITTLE, COAL MERCHANTS.

Prices of coal remain unchanged.

Lehigh Lump	$11 00
Lehigh prepared	10 50@11 00
Lackawanna, Wilkesbarre and Pittston	10 00

BITUMINOUS.

Briar Hill and Erie	8 00@ 8 50
Walnut Hill (West Va.)	8 00@ 8 50
Midway (West Va.)	8 00@ 8 50
Cannel	9 00@ 10 00
Blossburg	9 00
Indiana Block	6 50
Hocking "Brooks"	8 00
Wilmington and Illinois	5 00

Cincinnati, O.

There is a fair trade for the season. We quote:

	Bush.	Tons.
Youghiogheny, afloat	9 c.	$2 52
Ohio River	8 c.	2 24
Pittsburgh	11 c.	3 08
Anthracite	—	11 00

The following are retail prices delivered:

Ohio River, Pomroy	12 c.	3 36
Kanawha	13 c.	3 64
Kanawha Cannel	24 c.	6 72
Pittsburgh	12 c.	3 36
Youghiogheny	14 c.	3 92

Cleveland, O.

Youghiogheny, f. o. b., per ton	$4 75
Briar Hill	4 00
Massilion	3 75
Massilion nut	3 50
Chippewa	3 75
Hocking Valley	3 75
Morris	3 60
Cleveland Lump	3 00
Silver Creek	4 60
Anthracite, prepared	10 00
Anthracite, lump	11 00

Detroit.

The demand is steady and prices are unchanged.

Lehigh Lump, per ton	$11 00
Lehigh nut	10 00
Scranton, various sizes	9 50
Blossburg	9 50
Willow Bank	8 00
Briar Hill	8 50
Brookfield	8 50
Chippewa	8 00
Massilon	8 00
Straitsville	5 50
Nut	4 75

Indianapolis.

Per 2000 lb. WHOLESALE.	
Brazil Block	$3 65
Highland	3 60
" steam	3 30
Brazil nut	3 60
Slack	2 45
Virginia Cannel	9 00
Indiana Cannel	7 20
Steam Nut	2 25
Hocking Valley	4 20
Gas Coke per bush	12 c.
Pittsburgh	5 70
Sand Creek	5 00
Anthracite	12 00

Louisville, Ky.

	Bush.	Tons.
Pittsburgh, afloat	10 c.	$2 80
" retail	14 c.	3 92
Kentucky	12@14 c.	3 36@3 92
Indiana and Peacock Pomroy	12@14 c.	3 36@3 92
Anthracite, per ton, from yard	10 00@10 50	
" afloat	9 00@	

Mauch Chunk.

The prices for line trade are:

	* Lehigh.	Wilkes-Barre.
Lump	$3 35	$3 09
Steamboat	3 35	3 09
Broken	3 35	3 34
Egg	3 35	3 34
Stove	3 60	3 49
Chestnut	3 10	3 09
Pea	1 50	....

* Furnace coal remains at $3 50.

New Orleans, La.

Large supply, with but moderate demand. We quote:

Pittsburgh, wholesale, per bbl	45c.
" at retail	75c.
" per hhd	$7 00
" per box to steamboats	50c.
" " to manufacturers	60c.
Virginia cannel, per bbl	$1 25
Anthracite, per ton	$13 00

Omaha.

Blossburg (blacksmith)	$18 00	Wyoming	12 00
Anthracite	20 00	Missouri	6 50
Iowa	6 50		

Philadelphia.

ANTHRACITE.

Broken, in the yard	$5 50
Egg and Stove	5 75
Chestnut	4 75

BITUMINOUS.

Pennsylvania and Westmoreland Gas	7 50
Broad Top	5 25
Powelton Sterling	5 25
Derby	5 50

75 cents per ton additional for delivery.

Pittsburgh, Pa.

Connellsville coal	per ton, $2 00@2 25
Youghiogheny, at Pittsburgh	2 25
Youghiogheny, at the mines	2 00
Coke on cars " "	3 25
Castle Shannon on Platform	per bushel, 9½ c.
Anthracite, nut, per ton	per ton 7 25
" broken	7 50
" egg	7 50
" stove	7 50
" broken on cars	6 75
" stove " "	7 00

San Francisco.

From the *Commercial Herald*, March 5.

Imports for the past fortnight have been considerable, and the markets are void of all animation. Dealers are well stocked with assorted descriptions, while there is considerable stock in first hands. Coast supplies continue liberal. The imports from January 1st to March 1st were 885 tons anthracite and 46,381 tons of bituminous. We quote:

West Hartley, wholesale, ex ship,	per ton	$13 00
Wallsend, "	"	12 00
Australian, "	"	11 00@11 50
Coos Bay	"	10 00
Nanaimo	"	11 50
Bellingham Bay, ex ship	"	8 50
Mt. Diablo, coarse	"	8 50
" fine	"	6 25
Anthracite	"	16 00@17 50

St. Louis, Mo.

Delivered in St. Louis 4 cents per bushel extra.

Delivered to railroads and mills by car ferry 2c. per bushel extra.

	Per bushel.	Per ton.
Illinois coal, retail at East St. Louis	9 c.	$2 52
" " manufacturers	8½ c.	2 38
" " delivered	12@12½ c.	3 40
Big Muddy	14 c.	3 92
Trenton	12 c.	3 36
O'Fallon	10 c.	2 66
Anthracite, delivered in St. Louis		$13 50
Missouri cannel, " "		6 50
Indiana cannel		7 00

Toledo.

Grate	$9 00
Egg	9 00
Stove	9 00
Chestnut	9 00
Lehigh Lump	11 00
Blossburg	8 50@ 9 00
Briar Hill	7 00
Bituminous	$4 50 to 6 50 as per quality.

Halifax, N. S.

Sydney Coal, per chaldron	$8 50@ 9 00
Victoria " "	....
Gowrie	7 50
Little Glace Bay	7 50
Albion (at Cunard's wharf)	7 50

Toronto.

Scranton, all sizes, per ton	$7 50
Lehigh prepared, " "	8 50
" Lump	9 00
Bituminous	7 50
Blossburg	7 00

Montreal.

Scotch Steam, 2000 lb. ex yard	$8 00@ 8 50
Lower Port, do	7 50@ 8 00
New Castle Grate, ex yard	11 00@12 00
Welsh Anthracite, per 2000 lb	9 00@10 00
English Coke	—@—
Lump Lehigh, per 2000 lb	9 00@— —
Grate	10 00@— —
Egg, American Anthracite	9 50@10 00
Stove, " "	10 00@10 50
Chestnut " "	10 00@10 50

Provincial.

It will be noticed in the following that some of the prices have been fixed for 1874 shipments. Those items not having the * affixed may be considered as nominal.

	Coarse.	Slack.
*Block House, f. o. b. at Cow Bay	$2 25	$1 25
		Nut.
*Gowrie	2 00	1 50
	Coarse.	Culm of Coal.
Pictou, nett	$3 00	$1 50
Sydney	3 25	1 00
*Lingan	2 75	1 00
*Caledonia	2 25	....
*Glace Bay	2 25	....

* These prices are fixed for 1874, shipments f. o. b., gold.

Freights.

PORTS.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken **	From Philadelphia.†	From Baltimore.
Amesbury	....	2 70	....
Bangor	2 15	....	....
Bath	....	....	....
Boston	2 00	2 50	2 75
Bridgeport‡	85	1 40	2 10
Bristol	1 20	2 00	....
Charlestown, Mass.	....	....	....
Chelsea, "	....	....	....
Davenport	....	....	....
Derby	1 15	1 60	....
Dighton	....	2 25	....
East Cambridge	....	2 50	....
Fall River	1 20	2 00	2 15
Hackensack	....	....	....
Hartford	1 50	2 00	2 85
Hoboken	40	....	....
Jersey City	40	....	....
Lynn	....	....	....
Middletown	....	1 75	....
Mystic	....	1 40	....
New Bedford	1 30	2 00	2 20
Newburyport	2 25	2 60	2 85
New Haven	85	1 40	2 10
New London	1 10	1 50	2 20
Newport	1 20	2 00	....
New York?	§ 40	¶ 95	1 90
Norwalk	85	*1 30	2 25
Norwich	1 20	1 60	2 20
Pawtucket	1 30	2 15	...
Portland	2 00	2 50	2 75
Portsmouth, N. H.	2 20	2 65	2 85
Providence	1 20	2 00	2 15
Rockport	....	2 65	....
Saco	....	2 65	....
Somerset	....	....	....
Sag Harbor	1 20	....	....
Salem	2 00	2 50	....
Stamford	85	†95	....
Stonington	1 10	1 50	....
Taunton	....	2 25	....
Warren	1 20	2 00	....
Washington	....	....	....
Warscham	....	....	....
Wareham	....	....	2 80

*Towing from New York, 33⅓c. per ton.

† Add $75 per boat.

* Towing from New London about 10c. per ton.
† Nominal.
‡ Under 150 tons, $1 per ton.
§ Under 150 tons, 50c. per ton.
¶ This is the rate alongside. Delivery on wharf costs from 16c. to 18c. additional.
** Shipping from Rondout the same as from Weehawken, the extra expense being borne by the D. and H. Canal Co.

Freight on Pittston Coal—From Newburgh.

By boats of the Pennsylvania Coal Co., per ton of 2240 lbs.

Troy, Albany and Stuyvesant	60 c.
Nyack and Hudson and Boston R.R. dock, Hudson, discharged to cars	50 c.
Hudson, except as above, Rondout and Poughkeepsie	35 c.
Catskill, at mouth of creek, Sing Sing, Tarrytown, Piermont, and Yonkers	55 c.
Fishkill Landing and West Point	25 c.
Peekskill, Haverstraw, Saugerties, and Barrytown	45 c.

TOWING.

ON THE HUDSON RIVER.

	per ton.		per ton.
Manhattanville	8 c.	Haverstraw	17 c.
Spuyten Duyvel	9 "	Verplanck's Point	17 "
Yonkers	10 "	Peekskill & Newburg	18 "
Hastings	11 "	West Point & Cold Sp'g	20 "
Piermont & Dobbs Ferry	13 "	Poughkeepsie	22 "
Nyack & Tarrytown	15 "	Rondout	23 "
Sing Sing	16 "	Hudson	25 "
Croton Landing	17 "		

ON LONG ISLAND SOUND.

	per ton.		per boat.
Norwalk & Bridgeport	33⅓ c.	Port Morris	$20 00
New Haven	33⅓ "	West Farms, mouth of Creek	25 00
Derby ($50 per b't extra)	33⅓ "	West Farms	35 00
Southport & Westport	40 "	West Chester	30 00
Milford	40 "	College Point	25 00
Branford	45 "	Flushing & White Stone	30 00
New London	60 "	East Chester Town Dock	60 00
Middletown	65 "	New Rochelle & Glen Cove	50 00
Norwich	68 "	Mamaroneck & Port Chester	70 00
Hartford & Stonington	75 "	Greenwich, Stamford & Darien	75 00
Mystic	75 "		
	per boat.		
Harlem	$18 00		
Mott Haven	18 00		

Boats of 100 tons and under—per boat.

Manhattanville	$11 00	Spuyten Duyvel	$13 00
Yonkers	15 00	Tarrytown	18 00
Sing Sing	20 00	Peekskill	20 00
Newburgh	25 00	Poughkeepsie	30 00

To Elizabethport, full loads and return	$18 00
To Port Johnson " " "	16 00
To New Haven or Bridgeport	75 00

Harbor Towing ranges from 4 50 to $6 00.

IRON MARKET REVIEW.

Import Duties.

The following are the duties in Gold on Iron :

Flat iron, not less than 1, nor more than 6 inches wide, nor less than ⅛, nor more than 2 inches thick. *Round Iron*, not less than ¾, ner more than 2 inches in diameter, and *Square Iron*, not less than ¾, nor more than 2 inches square ₱ lb. 9-10 of 1c.

Flat Round or Square Iron, of larger or smaller sizes than the above mentioned, per lb 1 35-100c

Provided, that all iron in slabs, blooms, loops, or other forms, less finished than bars, and more advanced than pig iron, except castings, shall pay the same as iron does.

Provided, that none of the above iron shall pay less than 31½ per cent.

Railroad Iron	63c. per 100 lb.
Boiler plates, or other plate iron not less than 3-16 of an inch thick, per lb	1 35-100 c.
Scrap castings per ton	$5 40
" wrought " "	7 00
Pig Iron per ton	6 30

Iron ore 10 per cent. *ad valorem*.

New York,

March 19, 1874.

American Pig.—The state of the market is much the same as at the date of our last report. The majority of dealers have no sales worthy of mention to report. We learn of sales of 50 tons Glendon, No. 2 foundry at $31 ; 500 tons North River iron, on private terms, from second hands ; and 1000 tons Lehigh iron, for consumption on the Lehigh, on private terms. There are no sales being made for season delivery at present prices. It is almost impossible to give prices actually realized, as nearly all sales of importance are reported as sold on private terms. Messrs. J. S. Kenedy & Co., of this city, Agents of the Cambria Iron Works, inform us that the Cambria Mills at Johnstown Pa., have entirely suspended operations. The coal miners in the Company's employ made a demand for an increase of wages, and as the Company have been working without profit to themselves, and only to afford employment to the men, they resolved to anticipate them, and close the works. We quote:

No 1, Foundry Anthracite	$34 00@35 00
No. 2, " "	32 00@32 00
Grey Forge	28 00@31 00
White and Mottled	23 00@26 00

Scotch Pig.—Prices are more firm than at the date of our last report, which is the effect of advices from Glasgow, of an increase in prices, and a general suspension of manufacturing, caused by strikes. There is no anxiety on the part of holders to sell at our regular quotations, as they anticipate an additional advance. We learn of sales of 100 tons of Eglinton at $37 50, at which price the sellers have since refused to close the balance of the same lot; and 100 tons at $39, time and interest. We quote :

Glengarnock	40 00@41 00
Coltness	43 00@44 00
Eglinton	39 00@40 00

Iron Rails.—A contract was closed yesterday for 2000 tons 50 lb. rails from a mill in Pennsylvania, on private terms. This is the first sale of importance we have been able to report for weeks. With this exception we learn of no sales and but little inquiry by parties desiring to pay cash. We quote American at the works, $58@60. English rails are only nominal.

Bessemer Steel Rails.—There have been no transac-

Coal Freights from the Anthracite Mines to the Principal Markets.

PER TON OF 2,240 POUNDS.

	SCHUYLKILL COALS.					
	From Pine Grove.	From Tamaqua.	From Port Carbon.	From Mount Carbon.	From Schuylkill Haven.	From Port Clinton.
To * Belmont and West Manayunk, via Philadelphia and Reading R. R., "main line"	$2 12	$2 07	$2 00	$1 99	$1 92	$
* Port Richmond, "for shipment," " " "	2 12	2 07	2 00	1 99	1 92	..
* Philadelphia and "retail yards," " " "	2 22	2 17	2 10	2 09	2 02	..
† Philadelphia, including the charge for the use of cars, barges, and for toll, via Schuylkill Canal	..	..	..	..	1 75	1 64
* Swede Furnace, " " "	1 88	1 83	1 76	1 75	1 68	..
* Aramingo, " " "	1 62	1 57	1 50	1 49	1 42	..
* Port Clinton, " " "	91	86	79	78	71	..
* Allentown, via East Pennsylvania Branch	1 57	1 52	1 45	1 44	1 37	..
* Columbia, Lancaster, and points on Lancaster Branch, via Reading and Columbia R. R.	1 77	1 72	1 65	1 64	1 57	..
* Heidelberg, via Lebanon Valley Branch	1 54	1 49	1 42	1 41	1 34	..
* Robesonia, via L. and T. Branch	1 35	1 49	1 42	1 41	1 34	..
* Lebanon " "	96	1 55	1 48	1 47	1 40	..
* Harrisburg and Paxton, via L. and T. Branch	1 38	1 72	1 65	1 64	1 57	..
* Dauphin, via Schuylkill and Susquehanna Branch	70	..	1 40	1 39	1 32	..
* Harrisburg, " " "	85	..	1 50	1 49	1 42	..
* Jonestown, via Labanon and Tremont Branch	90		1 80	1 79	1 72	..
* Lebanon, " " "	96		2 01	2 00	1 93	..
† Reading, including charges for the use of cars, barges, and for toll, via Schuylkill Canal	..	..	..	..	95	84
† Bridsburg, add $10 per boat, via Schuylkill Canal	..	..	..	..	65	60
† Trenton, N. J., " "	..	..	..	..	1 00	95
† New York, " "	..	..	..	..	1 62	1 57
† Wilmington, Del., " "	..	..	..	..	85	80
† Bridgeton, N. J., " "	..	..	..	..	1 60	1 55

	LEHIGH COALS.					
	From Penn Haven.	From Mauch Chunk.	From Phillipsburg.	From Upper Lehigh.	From Ashley.	....
To ‡ Newark, via Central Railroad of N. J.	2 43	2 29	1 51	—	—	—
‡ Mauch Chunk, " " "	14	—	—	—	—	—
‡ Phillipsburg,	92	78	—	—	—	—
‡ Elizabethport, Port Johnston, Hoboken and South Amboy, shipping and wharfage 35c. additional	2 07	1 93	1 15	—	—	—
High Bridge,	—	2 20	—	2 79	3 09	—
Somerville and Raritan,	—	2 60	—	3 19	3 49	—
Elizabeth, Canford, Westfield and Elizabethport, for consumption	—	2 75	—	3 34	3 64	—
Jersey City, Bergen Point and Communipaw	—	2 65	—	3 24	3 54	—
Andover, via Del., Lack., and Western R. R.	—	—	1 95	—	—	—
Port Oram, Dover and Boonton	—	—	1 40	—	—	—
§ Trenton, Somerset Junction and Greensburg, via Penn. R. R., Belvidere division	—	—	1 30	—	—	—
Trenton, for shipment, including shipping and wharfage	—	1 97	—	—	—	—
Owego, New York Penn. and N. Y. R. R., via Lackawanna Junction, "North"	3 06	—	—	—	—	—
Groton,	4 10	—	—	—	—	—
Auburn,	3 34	—	—	—	—	—
Waverly,	2 98	—	—	—	—	—
Athens,	2 94	—	—	—	—	—

* These tolls do not include wharfage or shipping expenses at tide ports.
† Ten per cent. is deducted from these rates for lump, steamboat and broken coal.
‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.
§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

tions and but little inquiry. We still quote American at $103 @105, currency, and English at about the same figures in gold.

Old Rails.—We are informed of sales aggregating 1600 tons at private terms. We quote at $40@45.

Scrap Iron.—We learn of a sale of 200 tons wrought scrap on private terms. We quote wrought at $42 50 and cast at $30 from yard.

Scotch Pig.

Latest by Special Cable Report.

Manufacturers stopped working on account of strike.

Coltness	100s.	Eglinton	92s.
Carnbroe	98s.	Glengarnock	96s.

Baltimore,

March 14, 1874.

The market for American pig is quiet, with a tendency in buyers' favor for anthracite. Prices are, however, nominally unchanged, and we quote as follows: No. 1 foundry, $34@$35; No. 2, $32@$33; and No. 3, $30@$31. Scotch pig is quiet, and we still quote Eglinton at $40 per ton.

Chicago,

March 16, 1874.

The market is dull. There have been no changes in prices during the last week. We quote pig iron as follows:

No 1 Summerlee	$52 00@ ....
No. 1 Coltness	53 00@ ....
No. 1 Glengarnock	51 00@ ....
No. 1 Eglinton	50 00@ ....
No, 1 Lake Superior	50 00@ ....
No. 2 Lake Superior	48 00@ ....
No. 2 Tuscarawas	48 00@ ....
No. 1 Missouri	49 00@ ....
No. 2 Missouri	47 00@ ....
Union "A" 1 (Anthracite)	44 00@ ....
Union "B" 1 (Anthracite)	42 00@ ....

Cincinnati.

March 16, 1874.

There appears to be more disposition on the part of buyers to come into the market at the present low figures. Sales of round lots of hot blast, mill and foundry grades have been made under concessions by furnaces. In car load lots prices are moderately firm at quotations. Car wheel irons are meeting with some domand at low prices.

HOT BLAST CHARCOAL.

Hanging Rock, No. 1, per ton	$38 00@40 00
" No. 2, "	35 00@37 00
" Forge	30 00@32 00
Tennessee No 1	35 00@37 00
Tennessee. No. 2	33 00@35 00
" Forge	30 00@32 00
Alabama, No. 1	35 00@37 00
Missouri, No. 1, Foundry	38 00@40 00
" No. 2	35 00@37 00

HOT BLAST STONE COAL.

Missouri, No. 1	37 00@38 00
" Forge	30 00@32 00
Ohio No. 1, Foundry	33 00@36 00
Ohio Forge	30 00@31 00

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel	55 00@60 00
Missouri "	55 00@57 00
Tennessee "	55 00@57 00
Kentucky "	55 00@57 00
Georgia "	55 00@57 00
Alabama "	55 00@57 00
Machinery and Forge	55 00@57 00
Blooms	100 00@110 00

Cleveland.

March 18, 1874.

C. E. Bingham & Co., dealers in pig iron and iron ores, report the market as follows:

The market continues dull in all grades of pig iron. Prices remain the same as at the date of our last. We quote:

No. 1, Anthracite Foundry	$34 00@35 00—4 mos
No. 2, " "	32 00@33 50—4 mos
No. 1, Bituminous "	34 50@35 50—4 mos
No. 2, " "	33 00@34 00—4 mos
No. 1, Grey Forge Bituminous	30 00@31 50—4 mos
No, 2, Close Grey	29 00@30 00—4 mos
No. 1, Massilon Black Band	37 00@37 50—4 mos
No. B-1 " "	35 00@36 00 -4 mos
No. 2 " "	34 00@35 00—4 mos
No. 1, Lake Superior Charcoal	42 00@44 00—4 mos
No. 2, " "	39 00@41 00—4 mos
No. 3, " "	45 00@47 00—4 mos
Nos. 4, 5, 6, " "	48 00@52 00—4 mos

Detroit.

March 16, 1874.

Scotch pig, net	$46 00@ ....
Lake Superior pig, net	44 00@ ....

Louisville.

March 16, 1874.

Pig iron for all grades has been dull and prices are weak, and nominally unchanged. The demand for iron manufactures has been more quiet, but the tone is fairly active for small articles. We quote:

HOT BLAST—CHARCOAL.

No. 1 foundry, from Hanging Rock ores	$40 00@41 00
No. 2 " " "	35 00@37 00
No. 1, forge, " "	32 00@33 00
No. 1, foundry, " Tennessee "	35 00@36 00
No. 2 " " "	33 00@34 00
No. 1, forge, " "	31 00@33 00
No. 1, foundry, " Alabama "	36 00@40 00
No. 1, " " Iron Mountain "	41 00@43 00

HOT BLAST—STONECOAL.

No. 1, foundry, from Missouri ores	35 00@38 00
No. 2, " " "	32 00@34 00
No. 1, forge " "	30 00@32 00

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock ores	60 00@65 00
" " Tennessee "	55 00@56 00
" " Alabama "	58 00@60 00
" " Georgia "	58 00@60 00
" " Missouri "	55 00@60 00
" " Kentucky "	55 00@60 00

Pittsburgh.

March 17, 1874.

Reported for the ENGINEERING AND MINING JOURNAL by A. H. CHILDS, commission merchant for the sale of pig iron, blooms, ore, &c.:

The pig iron market continues devoid of animation. But little has changed hands since last report and quotations remain unchanged.

No. 1, Foundry, anthracite or bituminous	$33 00@34 00—4 mos
No. 2, " "	30 00@32 00—4 mos
No. 1, Grey Forge, "	29 00@30 00—4 mos
No. 2, " "	....@ ...
White and mottled "	27 00@28 00—4 mos

The Pittsburgh *Commercial* reports the following sales;

IRON MADE FROM LAKE SUPERIOR ORES, SMELTED BY BITUMINOUS COAL.

200 tons close gray forge	$28—4 mos
100 tons gray forge red short	29—5 mos
100 tons gray forge	30—4 mos
50 tons gray forge	28—cash.
20 tons No. 1 foundry	35—4 mos
20 tons No. 1 foundry	33—4 mos

ANTHRACITE.

150 tons gray forge	28—cash
100 tons mottled	27—cash
100 tons gray forge, neutral	29—4 mos
50 tons gray forge, neutral	28—cash
20 tons silvery	28 -4 mos
10 tons No. 1 foundry	32—4 mos

Philadelphia.

March 18, 1874.

There has been but very little doing in pig iron. There is considerable inquiry for rails, but we learn of no important transactions.

The following are quotations:

American No. 1	$34 00@35 00
American No. 2	32 00@33 00
American No. 3	29 00@30 00
Scotch—Glengarnock	40 00@41 00
" Eglinton	39 00@40 00
New rails, at works	58 00@60 00

San Francisco.

March 5, 1874.

We have before noted a serious decline in the price of bar, sheet and plate iron—say $20 per ton. The trade at present is very slack; even pig iron remains neglected at nominal rates—say $50 for Glengarnock, and $45@47 for American hard and gray.

St. Louis.

March 14, 1874.

The trade continues rather quiet. The disposition displayed by both buyers and consumers seems to be to await the development of future events before transacting business on a very large scale, and, consequently, sales are confined to present requirements. If anything, the general feeling seems to be steadier, and there has been no quotable change in prices during the last week. A good Spring business is looked for at remunerative rates. The demand for Iron Mountain and Maramac ores is on the increase, and shipments are improving. We quote as follows:

HOT BLAST STONE COAL PIG.

No. 1 foundry from Iron Mountain and Maramac ores,	$34@35
No. 2 foundry from Iron Mountain and Maramac ores,	32@33
No. 3 forge from Iron Mountain and Maramac ores,	29@31
No. 1 Massilon,	43@..
No. 1 Tennessee, cold short,	36@..
No. 1 Ohio, cold short,	40@..

HOT BLAST CHARCOAL PIG.

No. 1 foundry from Iron Mountain and Maramac ores,	36@43
No. 2 foundry from Iron Mountain and Maramac ores,	32@40
No. 1 foundry from Tennessee ores,	35@37
No. 1 forge from Tennessee ores,	31@33

COLD BLAST CHARCOAL PIG.

Hanging Rock car wheel,	60@64
Tennessee,	58@60

MISSOURI IRON ORES.

Iron Mountain Co.'s Quotations.

Iron Mountain, per ton	$8 00
Benton Creek, "	7 50
Surface ores, "	8 00
Red and brown hematites, per ton	5 00@6 50
Pilot Knob, per ton	5 50

THE BRITISH IRON TRADE.

LONDON, Feb 28, 1874.

During the last week there has been a general decline in prices, as has been the case from week to week for some time past. It is believed that there must be a continued reduction in the price of fuel, and that a decided fall in the price of iron must immediately follow. This feeling is withholding all orders that can be delayed, and which would otherwise be placed now. Reductions in wages are taking place in all sections. Notice has already been given at Nantyglo, in South Wales, that there will be a reduction of 20 per cent., and if there is not a marked improvement in business, it will become quite general for that district. The demand for finished iron has been very light, and prices have a downward tendency. There are but very few orders with the foundries; some quantities of heavy castings are being turned out, but in lighter castings, such as stoves etc., the demand is quite light. There has been a fair demand for axles, tyres, wheels, plates and boiler irons. We note a general decline in pig iron, but makers are selling at as low a figure as it can be manufactured for, at the present price of labor and fuel. In many cases the stocks are largely increasing. The Bessemer steel mills are all quite well employed in manufacturing for railroad purposes, and the larger works have orders which will keep them engaged until the middle of summer. Most of the rail mills in the North of England are again at work. The following are some of the principal quotations; South Staffordshire, No. 1, best foundry pig £9; No 2, £8 15s.; No. 3, £8 10s., and No. 4, £8 5s. "Bradley Bridge charcoal," grey £15, mottled £15 10s. white £16. North Staffordshire, No. 1, £5 12s. 6d., No. 3 £5 10s. At Barrow No. 1, Bessemer pig £8; No. 2, £7 17s. 6d.; No. 3 £7 15s. Cleveland pigs. No. 1, £4 2s. 6d.; No. 2, £3 19s.; No. 3, £3 17s 6d.; No. 4 £3 15s.; cinder £3 10s. Rails are quoted at Middlesbrough on Tees at £10 12s. 6d.; at Cleveland £10 10s.; in Wales £9 10s. to £10. India charcoal pigs in London, are quoted at £10@$12.

SCOTLAND The market for warrants at Glasgow, has fallen about 5s. since the last report, and the downward tendency appears to be maintained. The market opened on the 20th at 88s. 3d., and closed on the 25th at 87s. 6d., the highest point reached having been 90s. 9d., and the lowest, 86s. The amount of transactions has been somewhat larger than during the previous week, on account of speculators having, in a measure, renounced their fruitless efforts to keep up prices. There are a few inquiries from Germany. There is comparatively nothing doing in the bar trade, and makers are of the opinion that in a few weeks they will have to close for want of work. There have been reductions in some cases amounting to 20s. Shipments of pig iron from Scotch points during the week ending 21st inst. amounted to 9256 tons, being 2118 more than in the previous week, but 3056 tons below those of the corresponding week in 1873. The imports of Middlesbrough pigs at Grangemouth for the week were 2733 tons, being 447 less than in the previous week, and a decrease of 267 tons on the corresponding week of last year. The malleable iron trade is in even a worse position than it was a week ago. The following are the quotations of the principal makers' brands of pig, which have fallen considerably during the last week: Gartsherrie, No. 1, 100s.; No. 3, 93s.; Coltness 102s. 6d.; and 92s.; Summerlee, 97s. 6d. and 90s.; Carnbroe, 97s. 6d. and 92s. 6d.; Monkland, 92s. and 90s.; Clyde, 92s. and 90s.; Langloan, 100s. and 92s. 6d.; Calder, 102s. 6d. and 91s.; Glengarnock, 98s. and 92s.; Eglinton 93s. and 91s.; Dalmellington, 94s. and 92s.; Carron, 102s. 6d.; Shotts, 105s. and 97s. 6d.; Kinneil, 97s. 6d. and 92s. 6d.

THE BRITISH COAL TRADE.

LONDON, Feb. 28, 1874.

The general condition of this branch of business is remarkably dull. The demand in most sections is considerably below what would be expected for this season of the year, and is not near so great as in former years. It is quite probable that coal will reach the lowest point at which it can be produced, and that wages must submit to a very considerable reduction. The policy adopted by the miners at many collieries, of working but three or four days per week, and reducing the output, thereby maintaining higher prices, cannot be accepted by the colliery owners, who find they have to meet increased competition from the many new collieries which have been opened out during the last year. Prices are now reaching a point whereat it will be necessary to produce the largest possible quantity, to be able to work without a loss. When this is fully reached, and it is thought that prices have attained their lowest point, there will probably be a great revival in many manufacturing interests, which have been so greatly controlled by the price of fuel for more than a year past. The desire to secure orders is so great, that it appears impossible to maintain a regular quotation, as there is always some one to underbid the market. In isolated cases, there is a good demand for some particular kinds of coal; but the general demand is quite light, and stocks are accumulating. The following are some of the leading quotations: *Durham* household, at pits, 17s. per ton; inferior sorts of unscreened manufacturing coals, 9s.; good do., 10s.@11s. 6d.; screened, 14s. 6d.@14s.; coke at the ovens, 26s. At *Cleveland*, manufacturing coals, at the pits, 13s.; puddling coal, 11s.; and mill coal, 13s.

Wales.—The advices in regard to the coal trade are scarcely so encouraging as they have been. There is a good demand for steam coals, and the exports are on the usual large scale—to France, and other European markets, the East and West Indies, and to South America and Africa. In households the demand has fallen off very considerably of late, though fluctuating with the changes in the weather, and the probability is that it will still further recede as the weather grows warmer. Many of the pits are only doing two days' work in the week. Prices are generally adhered to. Best screened steam is quoted at 21s.@22s., f. o. b., and small at 11s.; steamers', 1s. per ton extra, on account of extra dispatch given them.

Scotland.—There is abundant evidence that a crisis is impending in the coal trade. No reductions in prices have been made; but the demand is so limited, that in order to induce a better trade, the coal masters are expected, at an early date, to announce a fall. Notices have been given of reductions in wages, ranging from 6d. to 2s. per day. In a few places the men have quietly accepted what they believe to be inevitable, and continue at work; but in others strikes have taken place. In *Fifeshire* the trade has been better. The following are the quotations there, f. o. b.: Main coal, 13s. 6d.@14s.; burnt coal, 17s. 6d.; smithy, 18s.@20s.; coke, malting, 34s.; Benniehill do., 36s.@40s., per ton.

Ireland.—The southern collieries have been worked more energetically than last year, but the northern are generally in a backward state, and are unable to compete in certain home markets with Scotch coals. Coal can be quoted at the pit's mouth at about 20s. per ton.